## REMARKS

Claim 31 is pending and stands rejected. Reconsideration of the above-referenced case is requested in view of the comments below.

The subject matter of Claim 31 is useful

Claim 31 stands rejected under 35 U.S.C. § 101 because the claimed invention allegedly is not supported by either a specific or substantial asserted utility or a well established utility. Claim 31 recites an isolated polynucleotide comprising SEQ ID NO: 2 or the coding region of SEQ ID NO: 2 that encodes SEQ ID NO: 1. Applicants disagree. The specification clearly contemplates the use of the disclosed nucleic acid sequences for diagnostic purposes, for example, to diagnose a cardiac disease by detecting the differential expression of a polynucleotide comprising SEQ ID NO: 2 or the coding region of SEQ ID NO: 2 that encodes SEQ ID NO: 1.

The biological activity of a compound will be relevant to an asserted use if there is a reasonable correlation between the activity in question and the asserted utility. *See Cross v. Iizuka*, 224 USPQ 739, 747 (Fed. Cir. 1985). In this case, the nucleotide sequence recited in Claim 31 has a specific or substantial utility for use as a diagnostic agent to diagnose a cardiac disease state such as myocardial infarction, cardiac hypertrophy, and viral myocarditis, by indicating the differential expression of a polynucleotide comprising SEQ ID NO: 2 or the coding region of SEQ ID NO: 2 that encodes SEQ ID NO: 1.

Support for this asserted utility can be found throughout the specification. For example, the specification discloses the use of the nucleotide sequences to "enable the analysis of cell, tissue, or peripheral blood samples." Page 42, lines 20-21. This analysis can be used to diagnose a cardiac disease by detecting the differential expression of the claimed sequence. See page 41, lines 27-30.

Differential expression of the claimed sequence was reasonably correlated to three specific cardiac diseases, myocardial infarction, cardiac hypertrophy, and viral myocarditis. In an *in vivo* myocardial infarction model, the claimed sequence was down-regulated by about 2-fold at the two week time point and about 1.8-fold at the sixteen week time point. In an *in vivo* cardiac hypertrophy model, the claimed sequence was down-regulate by about 2.5-fold at the ten week time point. Interestingly, the claimed sequence was found to have been up regulated by about 2-fold at the nine day time point. Similarly, expression levels of the claimed sequence were found to have been up regulated in an *in vitro* cardiac hypertrophy model. Because the present specification discloses a

correlation among differential expression levels of SEQ ID NO: 2 with a variety of cardiac disease states, Applicants submit that the claimed subject matter is supported by a specific utility.

The claimed subject matter is also supported by a substantial utility. Specifically, the claimed subject matter has a substantial utility in diagnosing various cardiac disease states, such as myocardial infarction, cardiac hypertrophy, and viral myocarditis. Because diagnosis of cardiac disease is a substantial utility, as opposed to mere experimentation, Applicants have asserted a substantial or real-world use for the claimed invention.

Applicants submit that one of ordinary skill in the relevant art would have known by reading the disclosure of the present application that the claimed subject matter had utility as a diagnostic reagent for detecting conditions related to cardiac diseases such as myocardial infarction, cardiac hypertrophy, and viral myocarditis. As such, Applicants request that the present rejection of Claim 31 be withdrawn.

Claim 31 is supported by an enabling specification

Claim 31 was also rejected under 35 U.S.C. § 112, first paragraph, as allegedly lacking enablement because one of ordinary skill in the art would not know how to use the claimed invention without undue experimentation. Applicants disagree.

The test for enablement is not whether some experimentation is required to practice an invention but whether an undue amount of experimentation is required. Here, one of ordinary skill in the art would be aware of the techniques necessary to use the claimed subject matter as a diagnostic reagent. For example, if a skilled artisan desired to assay a patient for the presence of a cardiac disease such as infarction, hypertrophy, or viral myocarditis, the skilled artisan would obtain a cardiac biopsy and determine the expression level of the claimed sequence. Methods for performing endomyocardial biopsies are well known in the art. For example, see Mason, *et al.*, "Clinical merit of endomyocardial biopsy," *Circulation*, 79:971-979 (1989). A copy of Mason, et al is enclosed for your reference in an accompanying Supplemental Information Disclosure Statement. Methods for determining expression levels of the claimed sequence are also well known in the art and discussed in the present specification. Once the expression level of the claimed sequence is determined to be either up or down regulated, a clinician could conclude that the subject was indeed suffering from a cardiac disease.

The Examiner argued in the Office Action that further experimentation would be required to use the claimed subject matter. Applicants disagree. The claimed subject matter functions as a diagnostic and serves the specific and substantial purpose of allowing a clinician to make an initial assessment regarding whether a patient is suffering from a cardiac disease such as infarction, hypertrophy, or viral myocarditis. Applicants submit that this information is useful in and of itself. Thus, based on the teachings of the specification and knowledge held by those of ordinary skill in the relevant art, the claimed subject matter can be practiced by one of ordinary skill in the art without undue experimentation.

Even if some modicum of additional experimentation was required to further diagnose a subject in view of the results obtained from the diagnostic procedure described above, this additional experimentation does not remove the utility of the claimed invention. The test for enablement is not whether any additional experimentation is required to practice the claimed invention; the proper test is whether the additional experimentation is undue. Applicants submit that once a clinician had obtained the results from a diagnostic test using the claimed subject matter, any additional tests required to more specifically diagnose a patient would not rise to the level of undue experimentation.

In light of the remarks provided above, Applicants submit that the subject matter of the pending claim is fully supported by an enabling disclosure. As such, Applicants request withdrawal of the present rejection.

## CONCLUSION

Applicants submit that the pending claim is in condition for allowance and that all issues raised in the outstanding Office Action have been addressed. Nevertheless, the Examiner is invited to contact the undersigned to discuss any questions that may remain.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant(s) petition(s) for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit **Account No. 03-1952** referencing docket no. 219002031700.

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Respectfully submitted,

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